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Serial Number 10/777,160
Navy Case No. 96,106
Amendment In Response To Final Office Action

FEB 01 2008

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraphs numbered [002], [005], [008], [009] and [0012] with the following paragraphs:

[0002] CROSS-REFERENCE TO RELATED APPLICATION

This application is a division of ~~pending~~ application number 09/726,028, filed Nov. 30, 2000, now U.S. patent 6,740,205, entitled, "Processing of Shipboard Wastewater."

[0005] In accordance with the present invention, wastewater is processed in a flash chamber under vacuum established within an upper section thereof by a vacuum pump. Before delivery to the flash chamber, the wastewater is preheated in a heat exchanger to enhance subsequent flashing thereof effected by entry through an orifice. In the flash chamber the wastewater is converted to a water vapor portion in a single evaporation stage, and also into a contaminate portion having oil droplets. Water vapor produced by such flashing rises into and fills the upper chamber section, while liquid waste oil droplets are deposited into a bottom section of the flash chamber. A de-mister filters out contaminants from the rising water vapor entering the upper section of the flash chamber and liquefied water vapor is collected therebelow during removal of such rising water vapor from the flash chamber in a superheated or saturated condition for condensation by cooling. The water condensate and the waste oil are respectively withdrawn by distillate and drain pumps under automatic level sensing switch controls. The water condensate withdrawn by the distillate pump is conducted through an oil

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content monitor for overboard discharge from a distillate tank, while the waste oil or contaminants from the bottom of the flash chamber is delivered by the drain pump to a waste storage tank to which the water condensate is delivered when an excessive amount of contaminant is detected therein. Level sensors associated with the automatic pump drive controls shut down the distillate pump when the water condensate within the distillate tank drops below a predetermined level. On the other hand, the drain pump is turned on and off automatically under level sensor control in order to prevent it from running dry and to maintain the vacuum inside the flash chamber. An alarm is activated by a pressure sensor to alert the operator when the vacuum in the flash chamber is lost. When the desired vacuum pressure is attained for flashing to occur, the vacuum pump is automatically turned off under pressure control by the flash chamber pressure sensor.

[0008] Figure 1 is a [[A]] schematic diagram depicting [[s]] a wastewater processing system in accordance with one embodiment of the present invention, showing various components of the system interconnected by operational circuitry.

[0009] Referring now to the drawing Figure 1 in detail, it diagrams a shipboard system for processing wastewater such as bilgewater or graywater received from a source such as a wastewater holding tank 10. According to the embodiment illustrated, the wastewater from the holding tank 10 is initially received through an inlet 14 into an inflow pump 12 for pressurization within a processor, generally referred to by reference numeral 16, from which an oil-free or contaminant free water condensate is obtained for overboard discharge through an outlet 18.

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[0012] Rise of the water vapor within the upper section 23 of the flash chamber 22 is enhanced by the vacuum maintained therein under operation of the vacuum pump 28, with the liquid waste oil or contaminants deposited into and retained within a bottom section 21 of the flash chamber 22. Such waste oil or contaminants in the bottom section 21 is derived from the wastewater heated in the condenser 26 and preheated further within the heat exchanger 34 to a predetermined temperature level, such as approximately 175°, before delivery to the flash chamber 22 through an entry orifice 44 to enhance flashing thereof within the flash chamber 22. In the flash chamber 22 the wastewater is converted to a water vapor portion in a single evaporation stage, and also into a contaminate portion having oil droplets. A portion of such wastewater which flashes into water vapor within the flash chamber 22 rises into the upper chamber section 23. Heat is supplied for wastewater preheating to the heat exchanger 34 from a suitable source 35, such as an existing hot water supply system or an electric heater, under control of a temperature transducer 61 as hereinafter explained.